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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,845	03/21/2006	Kornelis Meinds	NL 031141	3712

65913 7590 09/17/2008

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EXAMINER	
MARTELLO, EDWARD	

ART UNIT	PAPER NUMBER
2628	

NOTIFICATION DATE	DELIVERY MODE
09/17/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary	Application No.	Applicant(s)	
	10/572,845	MEINDS, KORNELIS	
	Examiner	**Art Unit**	
	Edward Martello	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Max et al. ("Polygon-based post-process motion blur;" The Visual Computer, no. 6, December, 1990; pages 308-314, hereafter 'VC6).

2. Regarding claim 1, Max teaches a method of generating motion blur in a graphics system, the method comprising: receiving (RA; RSS; RTS) geometrical information (GI) defining a shape of a graphics primitive (SGP,TGP) ('VC6; pg. 309, col. 1, last ¶), providing (DIG) displacement information (DI) determining a displacement vector (SDV;TDV) defining a direction of motion of the graphics primitive (SGP; TGP) ('VC6; pg. 310, equations 2-4), sampling (RA; RSS; RTS) the graphics primitive (SGP; TGP) in the direction indicated by the displacement vector (SDV;TDV) to obtain input samples (RPi; RIi) ('VC6; pg. 310, col. 1, ¶ 2), and one dimensional spatial filtering (ODF) of the input samples (RPi; RIi) to obtain temporal pre-filtering ('VC6; pg. 310, col. 1, ¶ 2).

3. In regards to claim 14, Max teaches a graphics computer system ('VC6; pg. 310; col. 1, ¶ 2) comprising: means for receiving (RA; RSS; RTS) geometrical information (GI) defining a shape of a graphics primitive (SGP,TGP) ('VC6; pg. 309, col. 1, last ¶), means for providing (DIG) displacement information (DI) determining a displacement vector (SDV;TDV) defining a

direction of motion of the graphics primitive (SGP; TGP) (‘VC6; pg. 310, equations 2-4), means for sampling (RA; RSS; RTS) the graphics primitive (SGP; TGP) in the direction indicated by the displacement vector (SDV;TDV) to obtain input samples (RPi; RIi) ('VC6; pg. 310, col. 1, ¶ 2), and means for one dimensional spatial filtering (ODF) of the input samples (RPi; RIi) to obtain temporal pre-filtering ('VC6; pg. 310, col. 1, ¶ 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Max et al. ("Polygon-based post-process motion blur;" The Visual Computer, no. 6, 1990, pages 308-314, hereafter ‘VC6) as applied to claims 1 and 14 above and in further view of Max et al. (“A Two-and-a-Half-D Motion-Blur Algorithm,” Proceedings of SIGGRAPH '85, Vol. 19, no. 3, July 22, 1985; pages 85-93, hereafter SIG).

5. In regards to claim 2, Max teaches a method as claimed in claim 1 and further teaches wherein the step of providing (DIG) displacement information (DI) further defines an amount of motion of the graphics primitive (SGP; TGP) (‘VC6; pg. 309, col. 1, last ¶) but does not teach wherein the step of one dimensional spatial filtering (ODF) is arranged to obtain the temporal pre-filtering with a size of a filter footprint (FP) that depends on the magnitude of the displacement vector (SDV;TDV). However, Max et al. discloses wherein the step of one dimensional spatial filtering (ODF) is arranged to obtain the temporal pre-filtering with a size of a filter footprint (FP) that depends on the magnitude of the displacement vector (SDV;TDV) (‘SIG; pg. 88, col. 1, ¶ 2) for the benefit of overcoming strobing effects in the animation of moving objects. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of the cited references to provide a method that provides computationally efficient motion blur animation and overcomes the stobing effects that may occur especially when the motion vector becomes large.

6. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Max et al. ("Polygon-based post-process motion blur" The Visual Computer, no. 6, 1990, pages 308-314, hereafter ‘VC6) as applied to claims 1 and 14 above, and further in view of Nakagawa (U.S. Patent Number 5,982,388, hereafter ‘388).

7. Regarding claim 3, Max teaches a method as claimed in claim 1 but does not teach wherein the displacement vector (SDV; TDV) is supplied by a 2D or a 3D application. Nakagawa, working in the same field of endeavor, however, teaches a method wherein a displacement vector (SDV; TDV) (motion attribute, ‘388; col. 5, ln. 33-67) is supplied by a 2D or a 3D application (‘388; col. 5, ln. 13-17) for the benefit of extending the computationally

efficient motion blur animation to include 3D animations allowing a wider market for the invention. It would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the teachings of Max and Nakagawa to allow the method to handle both 2D and 3D displacement vectors for the benefit of extending the computationally efficient motion blur animation techniques to include 3D animations allowing a wider market for the invention.

8. In regards to claim 4, Nakagawa further teaches wherein the step of providing (DIG) displacement information (DI) receives a model-view transformation matrix from a 2D or a 3D application, said matrix defining the position and orientation of the graphics primitive (SGP; TGP) of a previous frame ('388; col. 5, ln. 33-67, col. 6, ln. 1-6).

9. Regarding claim 5, Nakagawa further teaches a method wherein the step of providing (DIG) displacement information (DI) buffers a position and an orientation of the graphics primitive (SGP; TGP) of a previous frame to calculate the displacement vector (SDV;TDV) ('388; col. 6, ln. 37-41; col. 8, ln. 9-13).

10. Claims 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Max ("Polygon-based post-process motion blur;" The Visual Computer, no. 6, 1990, pages 308-314, hereafter 'VC6), as applied to claims 1-5 and above, and further in view of Meinds et al. ("Resample Hardware for 3D Graphics" Proceedings of the ACM, SIGGRAPH/EUROGRAPHICS conference on graphics hardware; Saarbrucken, Germany, September 2002, Pages 17-26, hereafter 'SIGE).

11. In regards to claim 6, Max teaches a method as claimed in claim 1 and further teaches wherein the graphics system is arranged for displaying pixels (Pi) having a pixel intensity (PIi)

on a display screen (DS), the pixels (Pi) being positioned on pixel positions (x, y) in a screen space (SSP) (‘VC6; pg. 309, col. 1, last ¶), the step of sampling (RA; RSS; RTS) is adapted for sampling (RSS) in the screen space (SSP) in a direction of a screen displacement vector (SDV) being the displacement vector mapped to the screen space (SSP) to obtain resampled pixels (RPi) (‘VC6; pg. 310, col. 1, ¶ 1), but does not teach the method further comprises an inverse texture mapping (ITM) receiving coordinates of the resampled pixels (RPi) to supply intensities (RIp) of the resampled pixels (RPi), the step of one dimensional spatial filtering (ODF) comprises averaging (AV) of the intensities (RIp) of the resampled pixels (RPi) to obtain averaged intensities (ARIp) in accordance with a weighting function (WF), the method further comprises a resampling (RSA) of the averaged intensities (ARIp) of the resampled pixels (RPi) to obtain the pixel intensities (PIi). Meinds, working in the same field of endeavor, however, teaches the method further comprises an inverse texture mapping (ITM) receiving coordinates of the resampled pixels (RPi) to supply intensities (RIp) of the resampled pixels (RPi) (‘SIGE; pg. 19, col. 1, § 2.1), the step of one dimensional spatial filtering (ODF) comprises averaging (AV) of the intensities (RIp) of the resampled pixels (RPi) to obtain averaged intensities (ARIp) in accordance with a weighting function (WF) (‘SIGE; pg. 19, col. 1, § 2.1; pg. 20, col. 2, § 3.2), the method further comprises a resampling (RSA) of the averaged intensities (ARIp) of the resampled pixels (RPi) to obtain the pixel intensities (PIi) (‘SIGE; pg. 19, col. 1, § 2.1) for the benefit of allowing texture mapping to occur in texture space being while the process is being driven by output pixels in screen space. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Max providing a computationally efficient motion blur solution with the teachings of Meinds’ inverse texture mapping for the

benefit of allowing texture mapping of motion blurred objects to occur in texture space with the texturing process driven by output pixels in screen space.

12. Regarding claim 7, Max teaches a method as claimed in claim 1 and further teaches wherein the graphics system is arranged for displaying pixels (Pi) having a pixel intensity (PIi) on a display screen, the pixels (Pi) being positioned on pixel positions (x, y) in a screen space (SSP) ('VC6; pg. 309, col. 1, last ¶) but does not teach the method further comprises providing appearance information (TA, TB) defining an appearance of the graphics primitive (SGP) in the screen space (SSP) by defining texel intensities (Ti) in a texture space (TSP), and he continues to teach the step of sampling (RA; RSS; RTS) is adapted for sampling (RTS) in the texel space (TSP) in a direction of a texel displacement vector (TDV) being the displacement vector mapped to the texel space (TSP) to obtain resampled texels (RTi) ('VC6; pg. 310, col. 1, ¶ 1), and does not teach the method further comprising interpolating (IP) the texel intensities (Ti) to obtain intensities (RIi) of the resampled texels (RTi), the step of one dimensional spatial filtering (ODF) comprises averaging (AV) the intensities (RIi) of the resampled texels (RTi) in accordance with a weighting function (WF) to obtain filtered texels (FTi), the method further comprises: mapping (MSP) the filtered texels (FTi) of the graphics primitive (TGP) in the texture space (TSP) to the screen space (SSP) to obtain mapped texels (MTi), determining (CAL) intensity contributions from a mapped texel (MTi) to all the pixels (Pi) of which a corresponding pre-filter footprint (PFP) of a pre-filter (PRF) covers the mapped texel (MTi), the contribution being determined by an amplitude characteristic of the pre-filter (PRF), and summing (CAL) the intensity contributions of the mapped texel (MTi) for each pixel (Pi). Meinds, however, teaches the method further comprises providing appearance information (TA, TB) defining an appearance of

the graphics primitive (SGP) in the screen space (SSP) by defining texel intensities (Ti) in a texture space (TSP) ('SIGE; pg. 19, col. 2, § 2.2), the method further comprising interpolating (IP) the texel intensities (Ti) to obtain intensities (RIi) of the resampled texels (RTi) ('SIGE; pg. 19, col. 2, § 2.2), the step of one dimensional spatial filtering (ODF) comprises averaging (AV) the intensities (RIi) of the resampled texels (RTi) in accordance with a weighting function (WF) to obtain filtered texels (FTi) ('SIGE; pg. 19, col. 1, § 2.1; pg. 20, col. 2, § 3.2), the method further comprises: mapping (MSP) the filtered texels (FTi) of the graphics primitive (TGP) in the texture space (TSP) to the screen space (SSP) to obtain mapped texels (MTi) ('SIGE; pg. 19, col. 1, § 2.1; pg. 20, col. 2, § 3.2), determining (CAL) intensity contributions from a mapped texel (MTi) to all the pixels (Pi) of which a corresponding pre-filter footprint (PFP) of a pre-filter (PRF) covers the mapped texel (MTi) ('SIGE; pg. 19, col. 2, § 2.2), the contribution being determined by an amplitude characteristic of the pre-filter (PRF), and summing (CAL) the intensity contributions of the mapped texel (MTi) for each pixel (Pi) ('SIGE; pg. 19, col. 2, § 2.2) for the benefit of implementing a forward texture mapping process which is texel drive and takes place in screen space. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Max for a computationally efficient motion blur method with the teachings of Meinds for the benefit of implementing a forward texture mapping process which is texel driven and takes place in screen space.

13. In regards to claim 8, Max and Meinds teach a method as claimed in claim 6 and Max further teaches wherein at least a direction of the displacement vector (SDV;TDV) of the graphics primitive (GP) is an average of directions of displacement vectors of vertices of the graphics primitive ('VC6; pg. 309, col. 1, ¶ 3).

14. Regarding claim 9, Max and Meinds teach a method as claimed in claim 6 and Meinds further teaches wherein the step of one dimensional filtering (ODF) comprises: distributing, in the screen space (SSP), the intensities (RIp) of the resampled pixels (RPi) in a direction of the displacement vector (SDV) over a distance determined by a magnitude of the displacement vector (SDV) to obtain distributed intensities (DIi), and averaging overlapping distributed intensities (DIi) of different pixels (Pi) to obtain a piece-wise constant signal being the averaged intensities (ARPi) ('SIGE; fig. 7; pg. 20, col. 2, § 3.2).

15. In regards to claim 10, Max and Meinds teach a method as claimed in claim 7 and Meinds continues to teach wherein the step of one dimensional filtering (ODF) comprises: distributing, in the texture space (TSP), the intensities (RIi) of the resampled texels (RTi) in a direction of the displacement vector (TDV) over a distance determined by a magnitude of the displacement vector (TDV) to obtain distributed intensities (TDIi) ('SIGE; fig. 7, pg. 20, col. 2, § 3.2), and averaging overlapping distributed intensities (TDIi) of different resampled texels (RTi) to obtain a piece-wise constant signal being the filtered texels (FTi) ('SIGE; fig. 7, pg. 20, col. 2, § 3.2).

16. Regarding claim 11, Meinds continues to teach a method wherein the step of one dimensional spatial filtering (ODF) is arranged for applying a weighted averaging function (WF) during at least one frame-to-frame interval ('SIGE; pg. 20, col. 1, § 3.1; pg. 20, col. 2, § 3.2).

17. In regards to claim 12, Max and Meinds teach a method as claimed in claim 9 and Meinds further teaches wherein the distance is rounded to a multiple of the distance (DIS) between resampled texels (RTi) ('SIGE; fig. 7; pg. 20, col. 2, § 3.2).

18. Regarding claim 13, Max teaches a method as claimed in claim 1 and further teaches a method wherein the graphics system is arranged for displaying pixels (Pi) having a pixel intensity (PIi) on a display screen, the pixels (Pi) being positioned on pixel positions (x, y) in a screen space (SSP) ('VC6; pg. 309, col. 1, last ¶) but does not teach the method further comprises the step of providing appearance information (TA, TB) defining an appearance of the graphics primitive (SGP) in the screen space (SSP) by defining texel intensities (Ti) in a texture space (TSP), and continues to teach the step of sampling (RA; RSS; RTS) is adapted for sampling (RTS) in the texel space (TSP) in a direction of a texel displacement vector (TDV) being the displacement vector mapped to the texel space (TSP) to obtain resampled texels (RTi) ('VC6; pg. 310, col. 1, ¶ 1), and does not teach the method further comprising interpolating (IP) the texel intensities (Ti) to obtain intensities (RIi) of the resampled texels (RTi), the step of one dimensional spatial filtering (ODF) comprises subdividing the displacement vector (TDV) in a predetermined number of segments ( ) to obtain segment displacement vectors (STDV), and for each one of the segments ( ): distributing, in the texture space (TSP), the intensities (RIi) of the resampled texels (RTi) with a direction, a position and a magnitude according to an associated one of the segment displacement vectors (STDV) to obtain averaged overlapping distributed intensities (TDIi) of different resampled texels (RTi) to obtain a piece-wise constant signal being the motion blurred filtered texels (FTi), the method further comprises for each one of the segments ( ): mapping (MSP) the filtered texels (FTi) of the graphics primitive (TGP) in the texture space (TSP) to the screen space (SSP) to obtain mapped texels (MTi), determining (CAL) intensity contributions from a mapped texel (MTi) to all the pixels (Pi) of which a corresponding pre-filter footprint (PFP) of a pre-filter (PRF) covers the mapped texel (MTi), the contribution

being determined by an amplitude characteristic of the pre-filter (PRF), and summing (CAL) the intensity contributions of the mapped texel (MTi) for each pixel (Pi). Meinds, however, teaches the method further comprises the step of providing appearance information (TA, TB) defining an appearance of the graphics primitive (SGP) in the screen space (SSP) by defining texel intensities (Ti) in a texture space (TSP) ('SIGE; pg. 19, col. 2, § 2.2), the method further comprising interpolating (IP) the texel intensities (Ti) to obtain intensities (RIi) of the resampled texels (RTi) ('SIGE; pg. 19, col. 2, § 2.2), the method further comprising interpolating (IP) the texel intensities (Ti) to obtain intensities (RIi) of the resampled texels (RTi) ('SIGE; pg. 19, col. 2, § 2.2), the step of one dimensional spatial filtering (ODF) comprises subdividing the displacement vector (TDV) in a predetermined number of segments ( ) to obtain segment displacement vectors (STDV), and for each one of the segments ( ) ('SIGE; pg. 21, col. 1, § 4): distributing, in the texture space (TSP), the intensities (RIi) of the resampled texels (RTi) with a direction, a position and a magnitude according to an associated one of the segment displacement vectors (STDV) to obtain averaged overlapping distributed intensities (TDIi) of different resampled texels (RTi) to obtain a piece-wise constant signal being the motion blurred filtered texels (FTi), the method further comprises for each one of the segments ( ) ('SIGE; fig. 10; pg. 21, col. 1, § 4): mapping (MSP) the filtered texels (FTi) of the graphics primitive (TGP) in the texture space (TSP) to the screen space (SSP) to obtain mapped texels (MTi) ('SIGE; pg. 21, col. 1, § 4), determining (CAL) intensity contributions from a mapped texel (MTi) to all the pixels (Pi) of which a corresponding pre-filter footprint (PFP) of a pre-filter (PRF) covers the mapped texel (MTi) ('SIGE; pg. 21, col. 1, § 4), the contribution being determined by an amplitude characteristic of the pre-filter (PRF), and summing (CAL) the intensity contributions of the

mapped texel (MTi) for each pixel (Pi) (‘SIGE; fig. 10 & 11; pg. 21, col. 1, § 4) for the benefit of implementing a forward texture mapping process which is texel driven and takes place in screen space and combines box reconstruction filtering and prefiltering into a single structure. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Max for a computationally efficient motion blur method with the teachings of Meinds for the benefit of implementing a forward texture mapping process which is texel driven and takes place in screen space and combines box reconstruction filtering and prefiltering into a single structure thus improving computational efficiency.

Conclusion

The following prior art, made of record, was not relied upon but is considered pertinent to applicant's disclosure:

US 6211882 B1	Analytic motion blur coverage in the generation of computer graphics imagery
US 5809219 A	Analytic motion blur coverage in the generation of computer graphics imagery.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edward Martello whose telephone number is (571) 270-1883. The examiner can normally be reached on M-F 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Xiao Wu can be reached on (571) 272-7761. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EM/

Examiner, Art Unit 2628

/XIAO M. WU/
Supervisory Patent Examiner, Art Unit 2628